



FOREST PEST MANAGEMENT

Pacific Southwest Region

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EVALUATION OF TRUE FIR TWIG MORTALITY ON THE GOOSENEST RANGER DISTRICT, KLAMATH NATIONAL FOREST

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ABSTRACT

Pityophthorus spp. twig beetles have caused extensive mortality of red and white fir twigs on Ball Mountain. Lower than normal amounts of precipitation and dense stocking have probably contributed to the high number of successful twig beetle attacks. Similar conditions exist on other parts of the District.

OBSERVATIONS

At the request of Thomas Farmer, District Ranger, Dave Schultz and John Kliejunas from the FPM Staff, and Russ Kazmierczak, Goosnest Ranger District Siviculturist, examined an area near Ball Mountain on November 4, 1981. Stands in the area were primarily red fir, white fir and lodgepole pine. Some white fir seedlings along a road cut and numerous twigs and branches in mature red and white fir had recently faded. Some of the seedlings and many of the twigs contained Pityophthorus spp. twig beetles. Twig beetles are rarely found in healthy, vigorous trees. They normally breed in injured, dying or shaded branches and are important in the process of natural pruning.

Several factors operating in the area are probably stressing the trees and predisposing them to twig beetle attack. Some of the red fir aggregations are overmature and the trees appear to be low in vigor. The stocking in some stands, predominated by smaller size class trees, is quite dense. This overstocking may also be contributing to tree stress.

Lower than normal precipitation is adding to the stress on trees in the area. Precipitation records for Ball Mountain are not available, but data from the Ranger Station located 5.5 miles east and from Yreka located 25 miles west indicate reduced amounts of rainfall over the last year. The average annual precipitation at the Ranger Station is 12.41 inches, but the total from September 1980 through August, 1981 was only 82 percent of normal. Annual precipitation at Yreka averages 18.83 inches, but the September, 1980 through August, 1981 total was 71 percent of this figure.

Two diseases present in the area could have a localized effect on the vigor of some trees. Dwarf mistletoe was present at low levels in a few of the true fir trees, but infections are not currently severe enough to account for the branch flagging. However, the disease should be considered in plans for future thinning or regeneration harvests in the area. Annosus root disease, caused by Fomes annosus, was present in one area examined. The disease commonly enters living true fir trees through basal wounds such as scars and logging wounds. It acts primarily as a root and butt rot in true firs, resulting in slow growth and cull rather than in tree mortality. Infection of true fir trees by Fomes annosus can be reduced by minimizing damage to residual trees during partial harvests or thinnings. In addition to designating the leave trees rather than the cut trees, contract provisions such as prohibiting logging prior to August 1, restricting the size of equipment and length of logs, and restricting the contractor to the use of predesignated skid roads, have reduced damage.

Twig flagging in true fir trees similar to that near Ball Mountain was also observed along Road 46N10 and U.S. 97. The widespread occurrence of these symptoms reinforces the impression that an underlying stress factor such as low precipitation is involved in the twig flagging. No evidence of attack by the fir engraver, Scolytus ventralis, or borers was seen on the trees with branch flagging, but these insects produce very few external signs of attack. Some scattered mortality or top kill could be evident next spring.

Primary insects or pathogens were not associated with the observed flagging. However, various measures can be taken to reduce tree stress and improve the general vigor of trees observed.

MANAGEMENT ALTERNATIVES

1. Do nothing. Trees in areas with overmature timber will grow slowly and may have little net growth due to butt rot. Trees in densely stocked areas will also grow slowly. Twig beetles will continue to attack branches of stressed trees, resulting in branch flagging. Periodic mortality will occur during droughts.

2. Thin densely stocked areas. If few residuals are damaged, the crop trees will grow at a faster rate and future mortality will be captured. Extensive wounding of true fir during thinning will make the stands unproductive.



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3. Regenerate overmature red fir aggregations. Old growth red fir can have high gross growth, but rot and mortality can cause low or negative net growth. Regeneration of these areas offers an opportunity for greater returns from the site. Regenerating the area would eliminate the current pest problems, but previous regeneration attempts in the area indicate that competing vegetation, gophers and grasshoppers could be problems.

The stand in which the aggregations occurred is a mixture of relatively even-aged, mature red fir, Douglas-fir, incense-cedar and numerous evergreen shrubs. The trees are larger than pine-plant or taller than 50-60 ft. Growth of the stand is presently about 3 rings per foot. The stand is a "low 4".